USE OF CO₂ IN THE SYSTEMS OF REFRIGERATING
OF TRADING ENTERPRISES

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In the article we examined the ways of using cooling systems for different food companies in which CO₂ used as a coolant. We made analytical examination of engineering decisions of cooling for trade enterprises which use CO₂ (in subcritical and supercritical cycles).

Was found that cooling systems which use CO₂ are more effective than systems with synthetic refrigerants if they work at subcritical temperatures.

This systems have such benefits: high temperature level require a small amount of refrigerant; temperature difference near cascaded heat exchanger is relatively low; on the side of high pressure of the different cooling systems we can use freon or ammonia; cascaded system with ammonia-carbon dioxide as a refrigerant has the highest efficiency.

The advantage of transcritical cooling systems with CO₂ is ability to effective using of heat recovery for getting hot water for technological needs.

Systems that use CO₂ have no problem with getting potential heat unlike freon systems. All heat of the work has high potential, all overheat can be used.

A common problem for both subcritical systems, and for transcritical is growth of pressure in system downtime. To solve this problem, there are several ways: to maintain pressure in the refrigeration unit at a reasonable level, you can use additional small refrigerators; install in the system expansion vessel, sufficient to offset growth of pressure in system downtime; design the system in the way it can withstand the pressure of downtime (pressure of saturated vapor at room temperature) is 80 bar.

Keywords: refrigerant, CO₂, refrigeration system, central cooling, subcritical cascade, transcritical booster.